

A Work Project, presented as part of the requirements for the Award of a Masters Degree in
Economics from the Faculdade de Economia da Universidade Nova de Lisboa

Hope, Change, and the Financial Markets:
Can Obama's Public Speeches drive the U.S Stock Market?

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A project carried out in the Macroeconomics area, under the supervision of:

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Lisbon, 2010

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Abstract

Barack Obama arose as President of the United States of America during a financial crisis, that has harmed everyone. While he talked of hope and change, the media praised his rhetoric. This paper proposes a methodology based on word occurrence and manual content analysis to analyse whether his public speeches drive the financial markets. The econometric evidence suggests that even though his speeches per se do not have an impact on the markets, some of his specific oratorical features do. This impact is visible both on contemporaneous daily returns and on cumulative (three days and seven days) returns.

Keywords: Stock Market, Public Speeches, Hope, Change

1. Introduction and Motivation

Barack Obama, the current president of the United States of America, is renowned for winning people's affections by talking of hope and conveying his message masterfully.

Barack Obama arose as President in the midst of crisis, the U.S economy was severely weakened and the American nation was overwhelmed with fear and uncertainty, in a time described by financiers like George Soros as "the worst financial crisis since the second world war" (Reuters, 22nd January 2008). It is not only the economic and financial context in which Obama's presidency started that create an interesting case for study, but also the man himself. Obama managed to overcome misgivings about his exotic name, humble background and multi-cultural origins to conquer the American heart. And he is known for achieving this using his rhetorical power. One recurrent question this study aims to answer is whether his optimism and eloquence are capable of affecting his audience's expectations and behaviour, regardless of their opinions about his politics. If this is so, such power of expression would also affect the markets, which is our main focus of this study. On the 7th of June 2008, *The Times* reported that listeners are deeply attracted to Obama's "mixture of Martin Luther King and John F. Kennedy." The words used to describe Obama's style are charismatic, eloquent and inspiring¹.

This essay seeks to analyse the impact of Obama's rhetoric on the US stock markets. An exploration will be made of the communicative skills that have enabled him to secure the title of a "rising star" first within the US Democratic Party and then as the President of the United States of America². This will involve identifying some of his techniques and interpreting the way in which his speeches are delivered. It will be asked whether such techniques are useful only to win over temporarily those that listen to the speeches, or whether they can exert such an influence as to affect stock market trends.

¹ 21st of January 2009 in the Harvard business blog; 19th November 2008, BBC news: Obama: Oratory and Originality

² 28th of June 2004, on democracynow.org

2. Barack Obama ³

Barack Hussein Obama was born on the 4th of August 1961, in Honolulu, Hawaii. He was born to a white American mother from Kansas and a black Kenyan father. He was raised by his mother and maternal grandparents. Supported by scholarships, he graduated both in political science from the Columbia University of New York and in law from Harvard University in Cambridge, Massachusetts, where he was elected the first African-American editor of the prestigious Harvard Law Review. He worked as a community organizer, practiced civil-rights law, taught at the University of Chicago Law School and helped organize voter registration drives. In 2004 Obama was elected to the U.S. Senate as a Democrat and in 2007, he made the headlines when he announced his candidacy for the 2008 Democratic Nomination. He has become the 44th president of the United States and the first African-American ever elected to that position.

3. Literature Review

Due to the empirical and case-specific nature of this project, there appears to be no literature that encompasses both the linguistic and financial angles of this study. There is, however, some popular literature about Obama's rhetoric and some academic literature about content analysis of other public speeches/communications. The purpose of this study will be to enrich such literature with the novelty of formalizing the texts about Obama's rhetoric and testing his influence on the financial markets.

There are a few studies of different public announcements, for instance a paper by Michelle Bligh and Gregory D. Hess (September 2005) about the positive aspects of Chairman Greenspan's communications on financial market variables. They use DICTION 5.0, a computerized content analysis program that calculates for each communication a measure of its

³ Based on *www.thewhitehouse.gov*

certainty, pessimism, optimism, activity, immediacy and jargon. They then include these variables in a regression where the financial market is the explained variable.

Carlo Rosa (2005) uses the descending hierarchical classification algorithm for European Central Bank (ECB) announcements. It is based on the co-occurrence of words and identifies characteristic themes of the announcements. He then tests whether or not the markets react to different topics of the ECB announcements. Ellyn Boukus and Joshua V. Rosenberg (2006) perform a similar analysis for the FOMC minutes using a statistical methodology called Latent Semantic Analysis, which also decomposes the texts in characteristic themes.

However this study is based on a manual codification of the speeches, mainly because algorithms are mechanical and leave no room for creativity, while the purpose of this study is to analyse the aspects mentioned in popular books, and formalize them, rather than simply using some pre-existing classification.

Two books were used to analyse Obama's communication features. The first, *The politics of hope – the words of Barack Obama* reviews Obama's career and main speeches before being elected president of the United States of America.⁴ It describes Obama's oratorical skills as "Ciceronian"⁵. The second book, *Say it like Obama*, focuses on the specific techniques that have enabled him to become one of the greatest speakers of recent times.⁶ It approaches both communication skills and presence on stage. It draws attention to Obama's awareness that it is insufficient merely to set goals and that a key factor for success is to present his policies in a more compelling way. Both books focus on how Obama speaks of hope, change, and a dream - the American Dream. They explain that by referencing past achievements he opens the way to future opportunities. He establishes a bond with the audience through stories and anecdotes and

⁴ Henry Russel (2009)

⁵ Ibid, p.9 ; Cicero was a Roman politician of the late republic, known as the best orator of the time and one of the best in history.

⁶ Shell Leanne (2009)

penetrates people's mind through repetition. Moreover Obama references past leaders and the Bible to shrink differences and strive for unity.

4. Methodology

The ultimate objective of this study is to regress the stock market on a group of *independent variables*, which will be different features of Obama's speeches.⁷ To isolate the effect of these variables, different *control variables* and *speech variables* will be used. While Supplemental Appendix 1 provides a formal definition of these variables a brief description here is clearly warranted.

4.1 Speeches⁸

In this paper only press conferences and speeches approaching economic issues, from the President's first day in office until the 30th of November, have been used.

4.2 Stock Market

The financial markets will be represented by the NASDAQ, S&P 500 and Dow Jones Composite returns⁹. Given that this study aims to quantify a global impact on the markets, it is important to use more than one index in order to represent in the best manner possible the financial state of the country.

4.3 Control Variables

In order to assess the results more accurately, the usual macroeconomic variables were included as control variables: Gdp and Inflation.

Jones and Banning (2009) proposed, just like this study, a model to explain market returns, but in this case through occurrences in elections and the model controls similarly for Gdp and Inflation.

⁷ The software E-views is used for the regressions.

⁸ The speeches were selected by the author, but to diminish the possible subjectiveness of this task another individual also repeated the selection, leaving only those speeches selected both times to be used.

⁹ Financial data was collected from www.finance.yahoo.com ; the data for weekends and holydays is missing

4.3.1 GDP

Gross Domestic Product is a global economic indicator and therefore a good proxy for the economic state of the country. It was chosen as a control variable, in order to measure the effect of Obama's rhetoric after taking into account the country's output effect.

4.3.2 Inflation

Inflation is a strong candidate as a control variable, since it is highly correlated with stock prices.¹⁰

4.4 Independent Variables – Content Variables

According to Shel Leanne when Obama speaks to an audience he breaks down any possible barriers, doing so by creating a sense of unity of vision and shrinking any possible differences. Then he goes one step further and wins over people's hearts. And once the hearts are conquered, Obama drives his points home and ends on a high tone.¹¹

The content variables will be divided in different groups according to their process of codification. The first set is labelled word frequency variables, these were measured counting the frequency of a word/expression relative to the total number of words per speech.

4.4.1 Dream

One of the independent variables is the relative frequency of the expression American Dream. By frequently mentioning the American Dream, the President is drawing attention to what all Americans have in common – their country and dreams. So this is one step to break down the barriers, making the audience perceive him not as some stranger, but as one more American who is struggling to attain his own American Dream and to create a more prosperous nation for all.

"Those core values of common sense and responsibility, those are the values that have defined this nation. Those are the values that have given substance to our faith in the American Dream."¹²

¹⁰ Jeong-Ryeol Kim (2002)

¹¹ *Say it like Obama*, by Shel Leanne(2009)

¹² Remarks by the President on the mortgage crisis (all speech names and dates are available in appendix 3)

4.4.2 Hope and Change

Two additional variables are the relative frequencies of the words Hope and Change. Obama talks of hope and change, two concepts every American is striving for through the current crisis and recession. So by talking about the hope to achieve a better America through change he is stressing common dreams, once again creating unity of vision.

“What you share is an entrepreneurial spirit, a tireless work ethic, and a simple hope for something better that lies at the heart of the American ideal.”¹³

4.4.3 Crisis

In a time of crisis it would be unusual to not talk about it. The question this study aims to answer, however, is whether talking about it repeatedly is positive or not. Whether it discourages people and impacts negatively the stock market or on the contrary, encourages them to act and impacts positively the markets.

“This was no longer just a financial crisis; it had become a full-blown economic crisis”¹⁴

The next group is constituted by a single variable constructed through a particular ratio.

4.4.4 Pronouns

Another variable is the ratio (we+us+our)/(I+me+my+you+you+they+them+their). Obama talks about the American people as one unified group, a group to which he belongs, therefore he mostly uses pronouns like *We* rather than *I*, *you* and *they*. Again, in so doing, he tries to avoid the division of people and the mention of any differences amongst them.

“We saw in stark relief how markets can spin out of control; (...)how close we can come to the brink (...)important lessons that we've learned, and that will help us move from a period of reckless irresponsibility, to one of responsibility and prosperity. That's what we must do.”¹⁵

¹³ Remarks by the President on Small Businessess and Health Insurance Reform

¹⁴ Remarks by the President on financial rescue and reform

¹⁵ Remarks by the President on financial rescue and reform

The following set is designated paragraph variables, since it's constituents were codified as a share of the total number of paragraphs per speech.

4.4.5 Details

To win the hearts and minds of an audience it is necessary to know them and to convey this understanding of their circumstances to them. This is why Obama presents, during his speeches, certain details about the audience to which he is speaking, or even starts certain speeches with testimonials of certain "average people", or mentions their names and the problems that they are facing. The audience looks for empathy and action, and a skilful orator can use such details to demonstrate that he realizes their needs, remembers and will act accordingly.

"We talked to Karen Cappuccio, who is still fending off foreclosure because her mortgage company duped her into taking out two expensive loans..."¹⁶

4.4.6 Anecdotes

This variable has five components: anecdotes, personal references, jokes, references to historical figures and closeness to the audience. The anecdotes and jokes turn a formal speech into a more informal conversation. The personal references, are references to his family or past. They show, on one hand, that besides President, he is also an average individual that is entrusting to the audience something about himself and, on the other hand, that 'he has been there, he knows'. By mentioning or quoting admired figures it is easier to win people over, because it is not some irrelevant person talking to them, but someone they believe in. Finally he also mentions, at various times, interactions with the audience, conversations he has had, or letters he has received, shrinking the gap between himself and the public.

"Everywhere I go, I meet Americans who've kept their confidence in their country and in our future."¹⁷

¹⁶ Remarks by the President on consumer financial protection

¹⁷ Remarks by the President on the Economy

"People say, oh, this is overload, we can't do this much. And I keep on trying to explain to people I don't do this just for fun. (Laughter.)"¹⁸

4.4.7 Repetition

Once their hearts are conquered, the speaker wants to convey a message to the audience. But the composition of the audience is broad and diverse, with different comprehension capacities. So to be successful Obama uses various forms of repetition, the two most used types being: Anaphora and Epiphora¹⁹. Through repetition various aims can be achieved. Obama, by repeating himself, creates a sense of unity, builds up to a peak, structures logically his thoughts, makes key points memorable and at the same time echoes Martin Luther King's *I have a dream* speech creating a sense of history.

"There are going to be bumps in the road and there are going to be times where people get impatient. There are going to be times where folks lose heart."²⁰

4.4.8 Objections

He drives points home, leaving no room for doubts by mentioning possible critiques and explaining carefully his reasons and the invalidity of those objections. This technique of addressing objections, is known as *procatalepsis*, and is a strong tool of persuasion. By identifying counterarguments and explaining a position, the original argument can be made much stronger.

"You keep on hearing these folks making these arguments about how we've got to be fearful of the future. I'm not interested in being afraid of the future. I'm interested in(...)"²¹

¹⁸ Remarks by the President at National Finance Fundraiser

¹⁹ Anaphora is the repetition of the same word or words at the beginning of sentences and Epiphora is the repetition of the same word or words at the end of sentences.

²⁰ Remarks by the President at National Finance Fundraiser

²¹ Remarks by the President at National Finance Fundraiser

4.4.9 Positive

When one studies Obama's speeches it is easy to verify that he does not just criticize nor praise. He speaks of hope and encourages change but he also points out everything that keeps the American People unhappy and all the mistakes committed by them and by their government. Therefore some of the paragraphs of his speeches have a very negative connotation while others are very positive. So the variable Positive is the proportion of positive paragraphs per speech. This is a very subjective variable that aims to quantify the effect of encouraging words on an average individual.

"So although it will take time and it will take patience, I am confident that our economy will recover. I'm confident that we're moving in the right direction. And I promise that I won't rest until America prospers once again."²²

Finally there is another singular set of variables that analyses only the last paragraph of each speech.

4.4.10 Ending Strong

Usually orators build up to a climax and then slowly come back down. Obama structures his speeches differently. He builds up to a peak as well, but he stays there and finishes strongly, with a call for action. So that the speech doesn't remain a mere speech but translates into action.

"I think we're ready(...)This generation of young people sitting here, they have an unparalleled opportunity. We are called upon to help them seize that opportunity. That's what you're doing here at Hudson Valley Community College. That's what I intend to make sure that we do in Washington. That's what we will do as a nation."²³

4.5 Independent variables - Speech Variables

In this category we have a dummy that equal the value 1 on the day of speeches, allowing to quantify the impact of the speeches per se.

²² Remarks by the President in the Rose Garden

²³ Remarks by the President on innovation and sustainable growth

5. Results

Recent research has examined the role that macroeconomic indicators have played in moving financial markets. Kim(2003), Engle and Rangel(2008) have used different models to quantify the impact of Gdp and inflation on financial markets. According to them both are statistically significant. Below is a similar simple regression:

$$\Delta Y_{it} = \alpha_1 + \alpha_2 GDP_t + \alpha_3 Inflation_t + \varepsilon_{it} \quad , \quad i = \text{S\&P500, Nasdaq, Dow Jones Composite} \quad (1)$$

where ΔY_t is the change in one of the market indexes, ε the error term, GDP the gross domestic product growth rate and Inflation the inflation rate.

The results for the three market indexes are the following:

Table 1 - Regression results for control variables at current day horizon

	(1)	(2)	(3)
	S&P500	Nasdaq	DowJones
GDP	0,000 (-0,011)	0,000 (-0,305)	0,000 (0,337)
Inflation	-0,002 (-0,783)	-0,002 (-0,957)	-0,002 (-0,839)
Nr. Of Obs.	218	218	218
R - squared	0,004	0,005	0,007
R adjusted	-0,005	-0,005	-0,002

Note: *20% significance level; **10% significance level, ***5%significance level

The control variables are insignificant and explain a very small share of the variation in market returns(between 0,4% and 0,7%). The negative adjusted R^2 statistic points towards poor specification, as well. Nevertheless, this is not surprising given that monthly and quarterly data have been used to explain daily variations.

To further explore Obama's rhetoric and quantify it's impact on the financial markets, equation (1) is augmented with speech and content variables. The speech variable is a dummy for the presence of a speech on day t. And the set of content variables allows for the

quantification of the impact of the linguistic features. The summarized results can be found on the next page.

On the basis of a 5% significance level, Hope and Anecdotes are both statistically significant. The positive coefficient of Hope means that an increase of one standard deviation in Hope, increases the S&P500 returns by 0,3%, while an increase of one standard deviation in Anecdotes decreases the returns by 0,32%.²⁴

Anecdotes is a variable constituted by different components, and most of these contribute to personalizing the speeches. This may, however, lower the level of credibility and therefore have a negative impact on people's expectations and markets. Another possible explanation might be the context in which this variable appears. Mostly the different components of this variable are used to show awareness of the problems the audience is facing. By so doing, however, the audience itself is reminded of these problems and concerns and, perhaps, this lowers their expectations and whereas has a negative impact on the markets.

When allowing for a 20% significance level, Dream, Objections and Ending Strong are significant as well with positive coefficients.

The adjusted R^2 is positive in the specifications that contain the variables Hope, Anecdotes and Objections. This is an important result, because despite this statistic being very low it is positive as opposed to the first regression with the control variables only. It shows that the inclusion of these variables contributes to a better specification of the model. Note that the adjusted R^2 is analysed instead of the R^2 , because the latter always increases with the inclusion of new variables.

Another pertinent result is the insignificance of the speech variable. It means that the speech per se does not explain changes in the markets. Despite this result, in what follows, this variable will be treated as a control variable, to help isolate the effect of the content variables.

²⁴ The interpretation of the coefficients is done by multiplying them by the standard deviation of the respective variables; the standard deviation and other descriptive statistics can be found in appendix 2

Table 2 - Results for S&P regression on each variable

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
GDP	0,000 (0,044)	0,000 (-0,018)	0,000 (0,043)	0,000 (0,062)	0,000 (0,281)	0,000 (0,032)	0,000 (-0,248)	0,000 (-0,043)	0,000 (-0,080)	0,000 (-0,007)	0,000 (0,005)	0,000 (-0,074)
Inflation	-0,002 (-0,878)	-0,002 (-0,788)	-0,002 (-0,836)	-0,002 (-0,828)	-0,002 (-1,058)	-0,002 (-0,877)	-0,001 (-0,572)	-0,002 (-0,890)	-0,002 (-0,763)	-0,002 (-0,789)	-0,002 (-0,838)	-0,002 (-0,980)
Day of speech	0,003 (1,084)											
Change		2,969 (1,139)										
Crisis			0,837 (0,604)									
Dream				7,173* (1,426)								
Hope					8,788*** (2,527)							
Pronouns						0,002 (1,140)						
Anecdotes							-0,011*** (-2,582)					
Details								0,031 (1,262)				
Objections									0,091* (1,603)			
Positive										0,001 (0,117)		
Repetition											0,005 (0,618)	
Ending Strong												0,007* (1,395)
Nr. of Obs.	218	218	218	218	218	218	218	218	218	218	218	218
R - squared	0,009	0,010	0,006	0,013	0,033	0,010	0,034	0,011	0,016	0,004	0,006	0,013
R adjusted	-0,005	-0,004	-0,008	-0,001	0,019	-0,004	0,020	-0,003	0,002	-0,010	-0,008	-0,001

Note: *20% significance level; **10% significance level, ***5%significance level

The tables below present the results for the, previously found, significant variables. The first table contains Dream and Ending Strong that appeared before as significant, but with a negative adjusted R^2 and the second table has the remaining significant variables:

Table 3 - Results for three market indexes regressed on Dream and Ending Strong

	(1)	(2)	(3)	(4)	(5)	(6)
	S&P 500	Nasdaq	DowJones	S&P 500	Nasdaq	DowJones
GDP	0,000 (0,088)	0,000 (-0,237)	0,000 (0,417)	0,000 (-0,036)	0,000 (-0,310)	0,000 (0,322)
Inflation	-0,002 (-0,884)	-0,002 (-1,030)	-0,002 (-0,912)	-0,002 (-0,988)	-0,002 (-1,093)	-0,002 (-0,976)
Day of speech	0,002 (0,712)	0,002 (0,632)	0,001 (0,463)	0,002 (0,464)	0,002 (0,435)	0,001 (0,378)
Dream	6,119 (1,166)	3,341 (0,629)	5,428 (1,074)			
Ending Strong				0,006 (0,990)	0,004 (0,619)	0,004 (0,653)
Nr. Of Obs.	218	218	218	218	218	218
R – squared	0,016	0,010	0,015	0,014	0,010	0,012
R adjusted	-0,003	-0,009	-0,003	-0,005	-0,009	-0,006

Note: *20% significance level; **10% significance level, ***5% significance level

When controlling for the day of speeches, both Dream and Ending Strong become insignificant in all specifications. Hope and Anecdotes remain significant, regardless of which market index is being explained while Objections only appears significant at a 20% significance level in the specification where Nasdaq is the dependent variable.

Table 4 - Results for three market indexes regressed on Hope, Anecdotes and Objections

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	S&P 500	Nasdaq	Dow Jones	S&P 500	Nasdaq	Dow Jones	S&P 500	Nasdaq	Dow Jones
GDP	0,000 (0,286)	0,000 (-0,051)	0,000 (0,579)	0,000 (-0,200)	0,000 (-0,497)	0,000 (0,144)	0,000 (-0,061)	0,000 (-0,388)	0,000 (0,273)
Inflation	-0,002 (-1,042)	-0,002 (-1,170)	-0,002 (-1,041)	-0,001 (-0,704)	-0,002 (-0,864)	-0,001 (-0,738)	-0,002 (-0,780)	-0,002* (-0,912)	-0,002 (-0,812)
Day of speech	-0,001 (-0,374)	-0,002 (-0,412)	-0,001 (-0,404)	0,006 (1,834)	0,005 (1,561)	0,005 (1,530)	0,001 (0,200)	-0,001 (-0,137)	0,000 (-0,013)
Hope	9,661*** (2,303)	8,529*** (2,007)	7,793** (1,923)						
Anecdotes				-0,013*** (-2,981)	-0,012*** (-2,839)	-0,012*** (-2,893)			
Objections							0,083 (1,191)	0,101* (1,439)	0,077 (1,156)
Nr. Of Obs.	218	218	218	218	218	218	218	218	218
R – squared	0,033	0,026	0,027	0,049	0,044	0,044	0,016	0,017	0,016
R adjusted	0,015	0,008	0,009	0,031	0,031	0,026	-0,003	-0,001	-0,002

Note: *20% significance level; **10% significance level, ***5% significance level

In what follows the variables will be added jointly to investigate whether any of the results change. Table 5 provides the summarized results.

Within the word frequency group, Hope is still significant at a 5% significance level in all three specifications. Change appears significant, as well, for the three indexes at a 20% significance level. Pronouns and Ending Strong are as before insignificant and the corresponding regressions have negative adjusted R^2 statistics.

Among the paragraph variables, Anecdotes and Objections are significant, as before. While Anecdotes is significant at a 5% significance level when explaining S&P500 and Dow Jones, it is only significant at a 20% significance level when explaining Nasdaq. Objections is only significant when using Nasdaq and at a 20% significance level. In addition to these, Positive is significant as well, at a 20% significance level when choosing Nasdaq or Dow Jones as the dependent variable.

The coefficient of Positive is negative reflecting that when the President's remarks have a positive connotation, meaning that they contain more encouraging paragraphs rather than paragraphs that criticize or are neutral, they have a negative impact on the markets. Perhaps an encouraging and positive message is overwhelming in the sense that it doesn't seem realistic. Most of the speeches/paragraphs are structured in the following manner: they criticize, point out issues, mention critical numbers and then are followed by encouraging words that persuade towards his policies. He depicts in the audience's mind a critical image, and presents his policies as the only solution to avoid that same frightening image. This was approached in The Wall Street Journal and was considered as "good politics and bad economics".²⁵

²⁵ The Wall Street Journal: Obama's rhetoric is the real "catastrophe" (February 13th 2009)

Table 5 - Results for regressions on groups of variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	S&P 500	Nasdaq	Dow Jones	S&P 500	Nasdaq	Dow Jones	S&P 500	Nasdaq	Dow Jones	S&P 500	Nasdaq	Dow Jones
GDP	0,000 (0,294)	0,000 (-0,048)	0,000 (0,586)	0,000 (0,038)	0,000 (-0,253)	0,000 (0,373)	0,000 (-0,252)	0,000 (-0,499)	0,000 (0,108)	0,000 (-0,036)	0,000 (-0,310)	0,000 (0,322)
Inflation	-0,002 (-0,979)	-0,002 (-1,108)	-0,002 (-0,980)	-0,002 (-0,881)	-0,002 (-1,020)	-0,002 (-0,906)	-0,001 (-0,615)	-0,001 (-0,705)	-0,001 (-0,638)	-0,002 (-0,988)	-0,002 (-1,093)	-0,002 (-0,976)
Day of speech	-0,005 (-1,067)	-0,006 (-1,207)	-0,006 (-1,130)	0,001 (0,187)	0,006 (0,942)	0,002 (0,263)	0,010 (1,127)	0,017** (1,854)	0,011 (1,259)	0,002 (0,464)	0,002 (0,435)	0,001 (0,378)
Change	4,269* (1,317)	4,976* (1,514)	4,287* (1,369)									
Crisis	-0,356 (-0,200)	0,025 (0,014)	-0,237 (-0,138)									
Dream	6,427 (1,213)	3,467 (0,646)	5,680 (1,110)									
Hope	11,028*** (2,536)	10,233*** (2,321)	9,195*** (2,189)									
Pronouns				0,002 (0,398)	-0,003 (-0,604)	0,001 (0,149)						
Anecdotes							-0,011*** (-2,367)	-0,009** (-1,909)	-0,010*** (-2,200)			
Details							0,020 (0,704)	0,015 (0,521)	0,019 (0,667)			
Objections							0,080 (1,123)	0,116* (1,627)	0,079 (1,157)			
Positive							-0,016 (-1,104)	-0,025* (-1,746)	-0,020* (-1,456)			
Repetition							-0,007 (-0,366)	-0,022 (-1,063)	-0,008 (-0,394)			
Ending Strong										0,006 (0,990)	0,004 (0,619)	0,004 (0,653)
Nr. of Obs.	218	218	218	218	218	218	218	218	218	218	218	218
R - squared	0,048	0,039	0,041	0,010	0,010	0,010	0,063	0,073	0,066	0,014	0,010	0,012
R adjusted	0,016	0,007	0,009	-0,009	-0,009	-0,008	0,027	0,038	0,030	-0,005	-0,009	-0,006

Note: *20% significance level; **10% significance level, ***5%significance level

Finally the remaining step is to add all the variables at the same time to the different regressions. It is important to find the most complete and correct specification, because the omitted variable bias threatens the unbiasedness of the results.

Table 6 - Regression results for all variables at a current day horizon, and along three days and seven days

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	S&P 500	Nasdaq	Dow Jones	S&P 500	Nasdaq	Dow Jones	S&P 500	Nasdaq	Dow Jones
	Contemporaneous			3 days accumulated			7 days accumulated		
GDP	0,000 (-0,042)	0,000 (-0,203)	0,000 (0,317)	0,000 (-0,222)	-0,001 (-0,950)	0,000 (0,339)	0,000 (-0,431)	-0,001* (-1,469)	0,000 (0,174)
Inflation	-0,001 (-0,750)	-0,002 (-0,769)	-0,001 (-0,699)	-0,003 (-1,079)	-0,004 (-1,169)	-0,003 (-1,028)	-0,013*** (-2,619)	-0,013*** (-2,476)	-0,013*** (-2,520)
Day of speech	-0,005 (-0,335)	0,016 (1,090)	-0,001 (-0,069)	-0,014 (-0,631)	0,009 (0,381)	-0,003 (-0,113)	-0,013 (-0,366)	0,014 (0,385)	-0,003 (-0,095)
Change	3,450 (0,879)	6,336* (1,598)	4,486 (1,183)	-5,866 (-0,929)	-2,003 (-0,313)	-3,100 (-0,493)	-20,50*** (-2,147)	-15,983* (-1,629)	-18,576** (-1,865)
Crisis	-0,385 (-0,218)	-0,151 (-0,085)	-0,337 (-0,198)	-2,507 (-0,884)	-1,974 (-0,686)	-2,847 (-1,009)	-7,685** (-1,792)	-7,648** (-1,741)	-9,290*** (-2,077)
Dream	12,925*** (2,247)	8,475* (1,459)	11,548*** (2,079)	19,889*** (2,151)	14,172* (1,511)	17,418** (1,892)	17,120 (1,224)	7,239 (0,504)	16,430 (1,126)
Hope	10,429*** (2,242)	10,255*** (2,183)	9,123*** (2,031)	4,676 (0,625)	4,399 (0,580)	5,013 (0,673)	1,352 (0,120)	5,240 (0,453)	3,574 (0,303)
Pronouns	0,006 (1,182)	-0,001 (-0,285)	0,004 (0,916)	0,014** (1,753)	0,003 (0,416)	0,011* (1,321)	0,013 (1,041)	-0,001 (-0,067)	0,011 (0,850)
Anecdotes	-0,009*** (-1,997)	-0,007* (-1,568)	-0,008** (-1,896)	-0,017*** (-2,317)	-0,017*** (-2,225)	-0,016*** (-2,155)	-0,023*** (-2,085)	-0,022*** (-1,986)	-0,025*** (-2,183)
Details	0,042 (1,187)	0,015 (0,425)	0,039 (1,138)	0,029 (0,512)	-0,008 (-0,136)	0,004 (0,064)	0,041 (0,480)	0,018 (0,203)	0,024 (0,270)
Objections	0,122* (1,508)	0,108* (1,316)	0,108* (1,371)	0,221** (1,693)	0,155 (1,169)	0,222** (1,705)	0,308* (1,559)	0,229 (1,135)	0,326* (1,583)
Positive	-0,029** (-1,957)	-0,036*** (-2,358)	-0,031*** (-2,158)	-0,029 (-1,222)	-0,032* (-1,307)	-0,034* (-1,402)	-0,049* (-1,340)	-0,050* (-1,331)	-0,057* (-1,502)
Repetition	-0,005 (-0,217)	-0,030 (-1,218)	-0,008 (-0,331)	0,002 (0,042)	-0,022 (-0,551)	-0,013 (-0,339)	0,054 (0,911)	0,028 (0,462)	0,050 (0,814)
Ending Strong	0,002 (0,197)	0,001 (0,169)	-0,001 (-0,070)	-0,010 (-0,828)	-0,009 (-0,724)	-0,012 (-0,995)	-0,002 (-0,117)	-0,005 (-0,286)	-0,004 (-0,206)
Nr. of Obs.	218	218	218	218	218	218	218	218	218
R – squared	0,118	0,116	0,112	0,115	0,101	0,123	0,145	0,130	0,158
R adjusted	0,057	0,055	0,051	0,054	0,039	0,063	0,086	0,067	0,100

Note: (1) *20% significance level; **10% significance level, ***5%significance level

(2) These regressions contain 15 dummies. Their description is available in appendix 4

The previous table presents three sets of results. The first three columns provide the contemporaneous effects for the three indexes, the next six columns repeat the same regression analysis except the dependent variable is now the 3 day and 7 day cumulative change in the indexes. These accumulated effects are important, because they allow 'reaction time'. Not

everyone hears the speech live, and wider time horizons take into account those who heard the speech or read about it some days later.

Starting with the exploration of the contemporaneous results, more specifically the word frequency variables, one can see that, just as before, Hope is significant in all three cases at a 5% significance level. The results for Change have slightly changed, since in this broader specifications it only appears significant, when explaining Nasdaq, at a 20% significance level. Dream appears significant at a 5% significance level in two of the regressions (S&P500 and Dow Jones) and at a 20% significance level for the remaining regression. The paragraph group contains the same significant variables as before with some slight changes in the levels of significance: Anecdotes and Objections are significant for all three indexes at least at a 20% significance level, while positive remains significant for all three indexes even at a 10% significance level.

The 3 day horizon provides us similar results, with the exception of Hope being insignificant now. Given that Hope was the main variable of interest until now, it is interesting to break down these three days into the day of the speech, the day after and two days after to figure out what causes the sudden insignificance.²⁶

Table 7 - Regression results for Hope at a current day horizon and at a one and two days horizon

	(1)	(2)	(3)	(4)
GDP	0,000 (0,281)	0,000 (-0,166)	0,000 (0,006)	0,000 (0,179)
Inflation	-0,002 (-1,058)	-0,001 (-0,565)	-0,002 (-0,789)	-0,002 (-0,872)
Hope	8,788*** (2,527)			8,741*** (2,503)
Hope1		-6,509** (-1,808)		-6,192* (-1,736)
Hope2			0,560 (0,137)	1,695 (0,421)
Nr. Of Obs.	218	218	218	218
R – squared	0,033	0,019	0,004	0,047
R adjusted	0,019	0,005	-0,010	0,025

Note: *20% significance level; **10% significance level, ***5% significance level

²⁶ The new variables, Hope1 and Hope2 are the time equivalents of Hope, technically this implies that they take the values of Hope with a one and two days lag respectively.

The table above shows that Hope has a significant negative impact the day after the speech occurs, and even though this is outweighed by the positive effect on the day per se, this might be the reason for the insignificance of Hope when a 3 day horizon is considered.

When considering a whole week, Change, Crisis, Anecdotes, Objections and Positive appear significant with negative coefficients. A striking detail is how Inflation appears for the first time significant at a 5% significance level for the three specifications of the accumulated one week effect. This reaffirms the initial conclusion of this section, that Gdp and Inflation appear insignificant only due to the shortcoming of trying to explain daily changes through quarterly and monthly data. So now that the dependent variable is weekly, inflation is statistically significant.

To finalize this study and strengthen its findings, the model is augmented by dummies that represent major events/announcements:

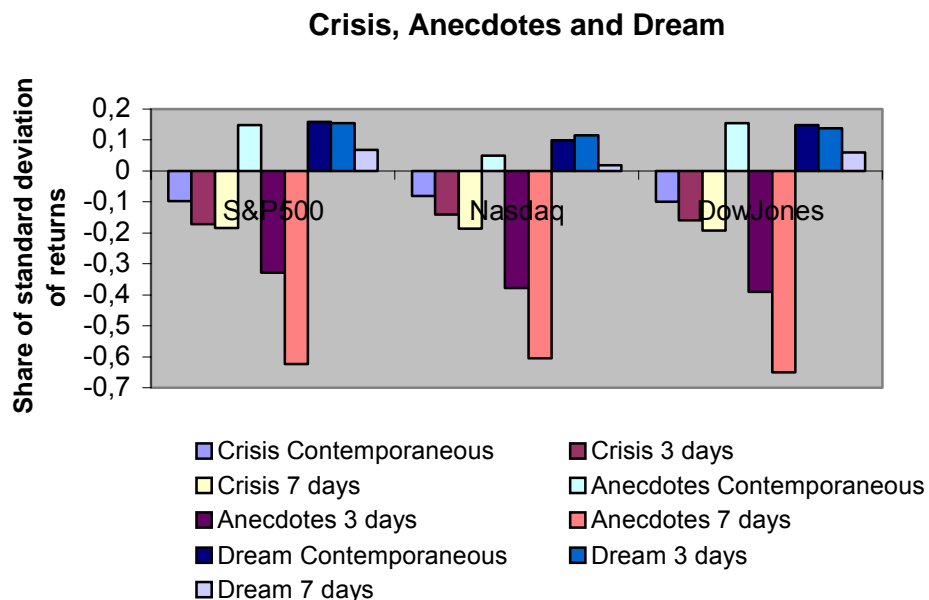
Tabela 8 - Regression results for all indexes, variables and time horizons with inclusion of 15 dummies

	S&P 500	Nasdaq	Dow Jones	S&P 500	Nasdaq	Dow Jones	S&P 500	Nasdaq	Dow Jones
	Contemporaneous			3 days accumulate			7 days accumulated		
GDP	0,000 (0,006)	-0,000 (-0,316)	0,000 (0,439)	-0,000 (-0,378)	-0,001 (-1,139)	0,000 (0,232)	-0,001 (-0,556)	-0,002** (-1,874)	0,000 (0,121)
Inflation	-0,001 (-0,724)	-0,002 (-0,759)	-0,001 (-0,734)	-0,003 (-1,039)	-0,004 (-1,273)	-0,004 (-1,205)	-0,012*** (-2,426)	-0,013*** (-2,718)	-0,012*** (-2,320)
Day of speech	-0,008 (-0,830)	0,002 (0,184)	-0,005 (-0,537)	-0,007 (-0,421)	0,004 (0,271)	-0,003 (-0,182)	0,030 (1,289)	0,046** (1,963)	0,037* (1,513)
Change	1,543 (0,405)	3,314 (0,855)	1,866 (0,508)	-6,686 (-1,084)	-3,384 (-0,558)	-5,511 (-0,929)	-13,708* (-1,528)	-12,058* (-1,345)	-12,947* (-1,384)
Crisis	-1,961 (-0,968)	-1,616 (-0,784)	-1,894 (-0,970)	-5,490** (-1,673)	-4,488* (-1,349)	-5,015* (-1,542)	-8,890** (-1,807)	-9,247** (-1,881)	-9,876** (-1,926)
Dream	12,469*** (2,197)	7,880* (1,364)	11,250*** (2,023)	19,515*** (2,122)	14,574* (1,556)	17,302** (1,890)	13,008 (0,939)	3,489 (0,252)	12,082 (0,837)
Hope	4,138 (0,852)	5,076 (1,026)	2,056 (0,613)	-3,565 (-0,453)					
Pronouns	0,003 (0,691)	-0,002 (-0,415)	0,002 (0,459)	0,011* (1,526)	0,004 (0,490)	0,009 (1,281)	0,004 (0,342)	-0,007 (-0,670)	0,003 (0,223)
Anecdotes	0,009 (0,563)	0,003 (0,199)	0,009 (0,560)	-0,032 (-1,213)	-0,037* (-1,347)	-0,038* (-1,432)	-0,093*** (-2,320)	-0,090*** (-2,235)	-0,102*** (-2,428)
Objections	0,125* (1,453)	0,111 (1,267)	0,107 (1,294)	0,134 (0,958)	0,082 (0,580)	0,151 (1,084)	0,188 (0,895)	0,087 (0,415)	0,207 (0,944)
Positive	-0,004 (-0,215)	-0,013 (-0,789)	-0,007 (-0,412)	-0,014 (-0,536)	-0,025 (-0,959)	-0,024 (-0,928)	-0,054* (-1,405)	-0,051* (-1,320)	-0,060* (-1,488)
Nr. of Obs.	218	218	218	218	218	218	218	218	218
R - squared	0,186	0,172	0,184	0,171	0,142	0,169	0,197	0,198	0,211
R adjusted	0,075	0,059	0,073	0,058	0,035	0,066	0,097	0,098	0,113

Note: *20% significance level; **10% significance level, ***5% significance level

Note that some of the insignificant variables were excluded from the regressions above, because their inclusion increases the standard errors of the estimated coefficients and decreases the adjusted R^2 . When controlling for important announcements/events, only Dream remains with a positive significant impact on the contemporaneous returns.²⁷ Over the longer horizon of 3 days Crisis appears significant, aside from Dream, with a negative coefficient. Changing the interval of analysis to a week increases the coefficient on the significant variable Crisis, turns Dream insignificant, and turns Anecdotes significant at a 5% significance level, with a negative coefficient. Change and Positive become significant, as well, at a 20% significance level.

Figure 1 - The impact of Crisis, Anecdotes and Dream on market returns over time



The graph depicted above shows how Dream loses its significance and magnitude after three days. When Dream increases by one standard deviation, the S&P500 returns increase by 15,89% of one standard deviation on the day of the speech and by only 6,78% of one standard deviation of the accumulated returns of one week. Crisis and Anecdotes are different from Dream, not only due to their sign difference but also because their magnitude is bigger when accounting for the returns of one week, rather than for one or three days.

²⁷ The sudden insignificance of a previously significant variable might be due to multicollinearity. After testing for it through the VIF method, the null hypothesis of multicollinearity was rejected.

6. Conclusions and Critique

Barack Obama's rhetoric has been praised widely around the globe, and this study tries to understand his linguistic techniques and analyse the possible effect of these on the stock markets. Firstly, Obama's oratorical characteristics were identified and according to them, his speeches were codified into variables. A simple regression of the stock market on macroeconomic indicators, was augmented by speech and content variables, first individually and then jointly. Moreover the insignificant variables were dropped, and further control variables were added.

Some of the key findings are that the variables Crisis, Change, Anecdotes and Positive are all statistically significant with a negative impact on markets, throughout one week. Given the broader and subjective nature of the variables Anecdotes and Positive, further research could be dedicated to decompose them and understand which components are particularly harming the markets. This subjectivity is one of the disadvantages of choosing to apply manual content analysis rather than computerized methods. Nevertheless one should try to minimize these shortcomings. The variable Positive could be improved by crossing the classification of more individuals, preferably Americans. Another drawback is that the word frequency variables ignore the context in which a concept is brought up.

Furthermore, the evidence shows that talking about the American Dream drives people's expectations up and consequently has a positive impact on the financial markets, however this impact lasts only on the day of a speech and on the two subsequent days.

Despite the small coefficients, the study's insights are valuable since they highlight the importance of the way a message is conveyed. A striking evidence of this is the insignificance of the speeches per se.

An important question remains, however, as to how Obama can fully exploit the gains from communication.

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Appendix 1

The variables **Crisis**, **Dream**, **Hope** and **Change** are relative frequency variables, meaning that they were built by counting the amount of times they appeared per speech and dividing that number by the total amount of words per speech. This was done by an online word frequency tool. **Pronouns** was constructed according to this fraction:

$$\frac{(\text{we}+\text{us}+\text{our})}{(\text{I}+\text{me}+\text{my}+\text{you}+\text{you}+\text{they}+\text{them}+\text{their})}$$
 The various pronouns were counted as well through the online tool. The variables **Details**, **Anecdotes** and **Objections** had to be constructed manually through careful analysis of the speeches. And the analysis was done paragraph by paragraph, being the scale a share of the total number of paragraphs per speech. The component **jokes** of the variable **anecdotes** was formed by counting the moments where speeches were interrupted due to laughter. The variable **Repetition** has both a manual and computerized component. The type of repetition that includes the repetition of more than one word is recognized by co-frequency counters. However anaphora (with the same word at the beginning of each sentence) isn't recognized by any online tool, so it has to be recognized manually. The end result is again the number of paragraphs where repetition was used divided by the total number of paragraphs per speech. Note that one type of Anaphora is starting each paragraph with the same words, so even though during the same paragraph no repetition was used, I considered the sequential paragraphs that start with the same word all as paragraphs that contain repetition. **Positive** requires classifying if a paragraph is positive/encouraging. So the classification of the paragraphs was done by the author and redone by another individual and only the paragraphs considered by both as positive were actually counted as positive. Finally, **Ending Strong** is a dummy variable that equals one whenever the last paragraph of a speech contains a call for action and 0 otherwise. Note that **all of the variables**, except the dummy, are relative to the total amount of words or paragraphs, to account for the size of the speeches.

If a speech does not take place on a day, then the content variables are all equal to zero.

Appendix 2

Table 1 - Descriptive Statistics

	Dream	Crisis	Change	Hope	Pronouns	Positive	Repetition	Anecdotes	Ending	Details	Day of Speech	Inflation	GDP
Mean	0,000	0,000	0,000	0,000	0,245	0,078	0,067	0,039	0,055	0,013	0,193	-0,867	-0,289
Median	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	-0,740	-0,700
Maximum	0,003	0,008	0,004	0,003	3,5	0,800	0,600	4,000	1,000	0,455	1	0,240	2,800
Minimum	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	-2,100	-6,400
Std. Dev.	0,000	0,001	0,000	0,000	0,576	0,182	0,149	0,289	0,229	0,048	0,395	0,710	3,617

Table 2 - Correlations

	Dream	Crisis	Change	Hope	Pronouns	Positive	Repetition	Anecdotes	Ending	Details	Day of Speech
Dream	1,000	0,324	0,139	0,175	0,144	0,322	0,319	0,122	0,054	0,066	0,290
Crisis	0,324	1,000	0,402	0,312	0,500	0,530	0,607	0,187	0,318	0,330	0,623
Change	0,139	0,402	1,000	0,133	0,488	0,553	0,650	0,170	0,543	0,253	0,556
Hope	0,175	0,312	0,133	1,000	0,571	0,530	0,423	0,108	0,342	0,280	0,569
Pronouns	0,144	0,500	0,488	0,571	1,000	0,789	0,764	0,233	0,407	0,301	0,872
Positive	0,322	0,530	0,553	0,530	0,789	1,000	0,834	0,346	0,522	0,402	0,880
Repetition	0,319	0,607	0,650	0,423	0,764	0,834	1,000	0,331	0,574	0,464	0,914
Anecdotes	0,122	0,187	0,170	0,108	0,233	0,346	0,331	1,000	0,098	0,167	0,277
Ending	0,054	0,318	0,543	0,342	0,407	0,522	0,574	0,098	1,000	0,475	0,494
Details	0,066	0,330	0,253	0,280	0,301	0,402	0,464	0,167	0,475	1,000	0,531
Day of Speech	0,290	0,623	0,556	0,569	0,872	0,880	0,914	0,277	0,494	0,531	1,000

Appendix 3

List of Speeches:

21-01-2009 President Barack Obama's Inaugural Address
28-01-2009 Remarks of President Barack Obama on the Economy
29-01-2009 Remarks By The President After Meeting With The Vice President And The Secretary Of The Treasury
02-02-2009 Remarks by the President and Governor Jim Douglas of Vermont Before Meeting to Discuss the American Recovery and Reinvestment Plan
06-02-2009 Remarks of President Barack Obama Economic Recovery Advisory Board
09-02-2009 Press Conference by the President
13-02-2009 Remarks by the President to the Business Council
17-02-2009 Remarks by the President and Vice President at Signing of the American Recovery and Reinvestment Act
18-02-2009 Remarks by the President on the mortgage crisis
26-02-2009 Remarks by the President on the Fiscal Year 2010 Budget
11-03-2009 Remarks by the President and Treasury Secretary Geithner After Economic Daily Briefing
13-03-2009 Remarks by the President and Economic Recovery Advisory Board Chairman Paul Volcker After Meeting
23-03-2009 Remarks by the president after Economic Daily Briefing, 3-23-09
09-04-2009 Remarks by the President After Housing Refinance Roundtable
14-04-2009 Remarks by the President on the Economy at Georgetown University
15-04-2009 Remarks by the President on Taxes, 4/15/09
20-04-2009 Remarks by the President after Cabinet meeting, 4/20/09
20-04-2009 Remarks by the President on Higher Education
04-05-2009 Remarks by the President on International Tax Policy Reform
07-05-2009 Remarks by the President on reducing spending in the Budget
11-05-2009 Remarks by the President on Reforming the Health Care System to Reduce Costs
12-05-2009 Remarks by the President after roundtable with business leaders to discuss employer health care costs
23-05-2009 Remarks by the President at signing of the credit card accountability, responsibility and disclosure act
01-06-2009 Remarks by the President on General Motors Restructuring
09-06-2009 Remarks by the President on "Pay as you Go"
23-06-2009 Press conference by the president
30-06-2009 Remarks by the President at National Finance Committee Fundraiser
23-07-2009 News conference by the president
31-07-2009 Remarks by the President on the Economy
05-08-2009 Remarks by the President on the Economy
07-08-2009 Remarks by the President and Ben Bernanke at the nomination of Ben Bernanke for chairman of the Federal Reserve
25-08-2009 Remarks by the President on financial rescue and reform
14-09-2009 Remarks by the President on innovation and sustainable growth
21-09-2009 Remarks by the President on the American Recovery and Reinvestment Act
30-09-2009 Remarks by the President on Consumer Financial Protection
09-10-2009 Remarks by the President on small business initiatives
21-10-2009 Remarks by the President Challenging Americans to Lead the Global Economy in Clean Energy
23-10-2009 Remarks by the President on Small Businesses and Health Insurance Reform
29-10-2009 Remarks by the President during the meeting of the President's Economic Recovery Advisory Board
02-11-2009 Remarks by the President in the Rose Garden
06-11-2009 Remarks by the President on the Economy
12-11-2009 Remarks by the President on the "Education To Innovate" Campaign

Appendix 4 – Timeline withdrawn from *wikipedia*

Dummy 1 - January 30 - Obama signs a presidential memorandum launching the Middle Class Working Families Task Force to be led by Vice President Joe Biden.

Dummy 2 - February 3 - Obama nominates Senator Judd Gregg to be Secretary of Commerce, after Bill Richardson withdrew his nomination. Obama grants five television interviews accepting responsibility for the nomination mistakes and talks about the economic stimulus bill.

Dummy 3 - February 6 - Obama announces the creation of the President's Economic Recovery Advisory Board. Obama also issues an executive order backing the use of union labor for large-scale federal construction projects.

Dummy 4 - February 17 - The White House launches Recovery.gov to explain the American Recovery and Reinvestment Act of 2009, including a video address from President Obama. Obama signs into law the \$787 billion Recovery and Reinvestment Act in Denver, Colorado.

Dummy 5 - February 26 - Obama reveals his proposal for the 2010 United States federal budget.

Dummy 6 - March 23 - Treasury Secretary Timothy Geithner unveils the government's plan to help investors purchase toxic assets from banks.

Dummy 7 - March 24 - Obama holds his second prime time press conference in the East Room of the White House, to discuss economic hardships, as well as the government's intentions to solve the global economic crisis.

Dummy 8 - May 20 - The Helping Families Save Their Homes Act of 2009 and the Fraud Enforcement and Recovery Act are signed into law by President Obama to help alleviate burdens caused by the economic financial crisis in the United States.

Dummy 9 - May 22 - Obama gives the commencement address at United States Naval Academy. He also the Credit CARD Act into law, to reform legislation and aim "...to establish fair and transparent practices relating to the extension of credit under an open end consumer credit plan, and for other purposes."

Dummy 10 - June 17 - Obama announces sweeping proposals to rework financial regulation and move the country toward financial stability.

Dummy 11 - June 26 - The President signs the "Cash-for-Clunkers bill" into law to increase national fuel efficiency, as well as stimulate the automobile industry, after both Chrysler and General Motors had filed for Chapter 11 bankruptcy.

Dummy 12 - July 27 - Obama and Chinese leaders Wang Qishan, Chinese Vice Premier, and Chinese State Councilor Dai Bingguo, attend the U.S.–China Strategic and Economic Dialogue held in Washington, D.C.

Dummy 13 - September 14 - President Obama speaks about the financial crisis at Federal Hall on Wall Street in New York City

Dummy 14 - October 21 - Obama, along with Treasury Secretary Timothy Geithner, speaks at the Metropolitan Archives, in Landover, Maryland to announce a package of initiatives to increase credit to small businesses.

Dummy 15 - October 22 - President Barack Obama signs the Veterans Health Care Budget Reform and Transparency Act in the East Room of the White House.